

SUBSECTION 8.12

## Hazardous Materials Handling

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## 8.12 Hazardous Materials Handling

### 8.12.1 Introduction and Summary

This subsection evaluates the potential effects on human health and the environment from the storage and use of hazardous materials in conjunction with the proposed San Francisco Electric Reliability Project (SFERP). Subsection 8.12.2 presents the laws, ordinances, regulations, and standards (LORS) applicable to hazardous materials; Subsection 8.12.3 describes the existing environment that may be affected, and Subsection 8.12.4 identifies potential impacts on that environment and on human health from site development. Subsection 8.12.5 discusses the offsite migration modeling. Subsection 8.12.6 discusses fire and explosion risk. Subsection 8.12.7 addresses potential cumulative impacts, Subsection 8.12.8 presents proposed mitigation measures, and Subsection 8.12.9 describes the agencies involved and provides agency contacts. Subsection 8.12.10 describes permits required and the permit schedule. Subsection 8.12.11 provides the references used to develop this section. Hazardous waste management, including handling of potentially contaminated soil and groundwater, is addressed in Subsection 8.13, Waste Management.

Most of the hazardous materials that will be used for the project are required for treatment and laboratory analysis of the cooling water, facility maintenance, wastewater treatment, and lubrication of equipment or will be contained within transformers and electrical switches. The project will comply with applicable laws and regulations for the storage of these materials to minimize the potential for a release of hazardous materials and will conduct emergency response planning to address public health concerns regarding hazardous materials storage.

Onsite storage of aqueous ammonia, required for the control of oxides of nitrogen emissions, presents the greatest potential public health risk due to the chemical properties of ammonia. However, the project includes specific design features (described in Subsection 8.12.4.2), that will control the extent of a gaseous release in the event of a catastrophic spill of ammonia. In addition, an offsite consequence analysis conducted for the project indicates that in the unlikely event of a catastrophic release, gaseous ammonia concentrations would not exceed 75 parts per million (ppm) (below California Energy Commission [CEC] significance level) beyond the property boundary to the north, south, or west, and not more than 90 feet from the ammonia tank to the east (barely over the property boundary between the proposed project and the existing Potrero Power Plant [Potrero PP] property). Therefore, storage of ammonia at the proposed project site will not present an unacceptable public health risk. Nevertheless, Applicant will prepare and maintain a risk management plan (RMP), described in Subsection 8.12.8.2.3, addressing the potential effects of an accidental release, a program for preventing a release, and emergency response procedures in the event of a release. The plan will be submitted to the San Francisco Department of Public Health and distributed to other agencies including the San Francisco Fire Department, which will be potentially responsible for assisting plant personnel in the event of a chemical emergency. Preparation and implementation of the RMP will further reduce the public health risks associated with the storage of ammonia at the SFERP.

## 8.12.2 Laws, Ordinances, Regulations, and Standards

The storage and use of hazardous materials and regulated substances at the facility are governed by federal, state, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination, and to protect facility workers and the surrounding community from exposure to hazardous and regulated substances. The applicable LORS are summarized in Table 8.12-1 and described below.

TABLE 8.12-1  
Applicable Laws, Ordinances, Regulations, and Standards

LORS	Applicability	Conformance (Section No.)
<b>Federal</b>		
<b>CERCLA/SARA/EPCRA</b>		
Section 302, EPCRA (Pub. L. 99-499, 42 USC 11022)  Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires one time notification if extremely hazardous substances are stored in excess of TPQs. The facility will have ammonia in concentrations greater than 20 percent and in excess of the threshold quantity of 20,000 pounds.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.2).
Section 304, EPCRA (Pub. L. 99-499, 42 USC 11002)  Emergency Planning And Notification (40 CFR 355)	Requires notification when there is a release of hazardous material in excess of its RQ.	An HMBP will be prepared to describe notification and reporting procedures (Subsection 8.12.8.2.1).
Section 311, EPCRA (Pub. L. 99-499, 42 USC 11021)  Hazardous Chemical Reporting: Community Right-To-Know (40 CFR 370)	Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.	The HMBP to be prepared will include a list of hazardous materials for submission to agencies (Subsection 8.12.8.2.1).
Section 313, EPCRA (Pub. L. 99-499, 42 USC 11023)  Toxic Chemical Release Reporting: Community Right-To-Know (40 CFR 372)	Requires annual reporting of releases of hazardous materials.	The HMBP to be prepared will describe reporting procedures (Subsection 8.12.8.2.1).
Section 112, Clean Air Act Amendments (Pub. L. 101-549, 42 USC 7412)  Chemical Accident Prevention Provisions (40 CFR 68)	Requires facilities that store a listed hazardous material at a quantity greater than the TQ to develop a Risk Management Plan. The facility will have ammonia in concentrations greater than 20 percent and in excess of the threshold quantity of 20,000 pounds.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.2).
Section 311, Clean Water Act (Pub. L. 92-500, 33 USC 1251 et seq.)  Oil Pollution Prevention (40 CFR 112)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	An SPCC will be prepared (Subsection 8.12.8.2.3).

**TABLE 8.12-1**  
**Applicable Laws, Ordinances, Regulations, and Standards**

<b>LORS</b>	<b>Applicability</b>	<b>Conformance (Section No.)</b>
Pipeline Safety Laws (49 USC 60101 et seq.)  Hazardous Materials Transportation Laws (49 USC 5101 et seq.)  Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (49 CFR 192)	Specifies natural gas pipeline construction, safety, and transportation requirements.	The natural gas pipeline will be constructed in accordance with 49 CFR requirements (Subsection 8.12.6).
<b>California</b>		
Health and Safety Code, Section 25500, et seq. (HMBP)	Requires preparation of an HMBP if hazardous materials are handled or stored in excess of threshold quantities.	An HMBP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.6.2).
Health and Safety Code, Section 25531 through 25543.4 (CalARP)	Requires registration with local CUPA or lead agency and preparation of an RMP if regulated substances are handled or stored in excess of TPQs.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.6.2).
Health and Safety Code, Section 25270 through 25270.13 (Aboveground Petroleum Storage Act)	Requires preparation of an SPCC plan if oil is stored in a single aboveground storage tank with a capacity greater than 660 gallons or if the total petroleum storage (including ASTs, oil-filled equipment, and drums) is greater than 1,320 gallons. The facility will have petroleum in excess of the aggregate volume of 1,320 gallons.	An SPCC plan will be prepared (Subsection 8.12.6.2.3).
Health and Safety Code, Section 25249.5 through 25249.13 (Safe Drinking Water and Toxics Enforcement Act) (Proposition 65)	Requires warning to persons exposed to a list of carcinogenic and reproductive toxins and protection of drinking water from same toxins.	The site will be appropriately labeled for chemicals on the Proposition 65 list.
California Public Utilities Commission (CPUC) General Order Nos. 112-E and 58-A	Specify standards for gas service and construction of gas gathering, transmission, and distribution piping systems.	Construction of the natural gas pipeline will comply with the standards specified in these General Orders (Subsection 8.12.6).
<b>Local</b>		
San Francisco Public Health Code, Article 21	Requires preparation of a Hazardous Materials Certificate of Registration and Hazardous Materials Business Plan for storage of hazardous materials.	A Hazardous Materials Certificate of Registration and HMBP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.1).
San Francisco Public Health Code, Article 21A	Requires preparation of a Risk Management Plan for regulated substances.	An RMP will be prepared for submittal to the San Francisco Department of Public Health (Subsection 8.12.8.2.2).

**TABLE 8.12-1**  
**Applicable Laws, Ordinances, Regulations, and Standards**

<b>LORS</b>	<b>Applicability</b>	<b>Conformance (Section No.)</b>
San Francisco Fire Code	Requires proper storage and handling of hazardous materials.	San Francisco Fire Code will be followed for design and construction of the hazardous materials handling facilities (Subsection 8.12.8.2.1).

**Notes:**

Cal ARP	California Accidental Release Program	MSDS	Material Safety Data Sheet
CAA	Clean Air Act [Amendments]	Pub. L.	Public Law
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	RMP	Risk Management Plan
CFR	Code of Federal Regulations	RQ	Reportable Quantity
CWA	Clean Water Act	SARA	Superfund Amendments and Reauthorization Act
CUPA	Certified Unified Program Agency	SERC	state emergency response commission
EHS	extremely hazardous substance	SPCC	Spill Prevention Control and Countermeasure Plan
EPCRA	Emergency Planning and Community Right-to-Know Act	TPQ	Threshold Planning Quantity
HMBP	Hazardous Materials Business Plan	TQ	Threshold Quantity
LEPC	local emergency planning committee	USC	United States Code

### 8.12.2.1 Federal

Hazardous materials are governed under the Comprehensive Environmental Response and Liability Act (CERCLA), the Clean Air Act (CAA), and the Clean Water Act (CWA).

**8.12.2.1.1 CERCLA.** The Superfund Amendments and Reauthorization Act (SARA) amends CERCLA and governs hazardous substances. The applicable part of SARA for the proposed project is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986 (EPCRA). Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key sections of the law are:

- Section 302 – Requires one time notification when extremely hazardous substances (EHSs) are present in excess of their threshold planning quantities (TPQs). EHSs and their TPQs are found in Appendices A and B to 40 Code of Federal Regulations (CFR) Part 355.
- Section 304 – Requires immediate notification to the local emergency planning committee (LEPC) and the state emergency response commission (SERC) when a hazardous material is released in excess of its reportable quantity (RQ). If a CERCLA-listed hazardous substance RQ is released, notification must also be given to the National Response Center in Washington, D.C. (RQs are listed in 40 CFR Part 302, Table 302.4). These notifications are in addition to notifications given to the local emergency response team or fire personnel.
- Section 311 – Requires that either material safety data sheets (MSDSs) for all hazardous materials or a list of all hazardous materials be submitted to the SERC, LEPC, and local fire department.

- Section 313 – Requires annual reporting of hazardous materials released into the environment either routinely or as a result of an accident.

**8.12.2.1.2 Clean Air Act.** Regulations (40 CFR 68) under the CAA are designed to prevent accidental releases of hazardous materials. The regulations require facilities that store a Threshold Quantity (TQ) or greater of listed regulated substances to develop a Risk Management Plan (RMP), including hazard assessments and response programs to prevent accidental releases of listed chemicals. Section 112(r)(5) of the CAA discusses the regulated substances. These substances are listed in 40 CFR 68.130. Aqueous ammonia is a listed substance and its TQ for solutions of 20 percent and greater is 20,000 pounds of solution.

**8.12.2.1.3 Clean Water Act.** The Spill Prevention, Control, and Countermeasures (SPCC) program under the CWA is designed to prevent or contain the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Regulations (40 CFR 112) under the CWA require facilities to prepare a written SPCC Plan if they store oil and its release would pose a threat to navigable waters. The SPCC program is applicable if a facility has a single oil aboveground storage tank (AST) with a capacity greater than 660 gallons, total petroleum storage (including ASTs, oil-filled equipment and drums) greater than 1,320 gallons, or underground storage capacity greater than 42,000 gallons.

Other related federal laws that address hazardous materials but do not specifically address their handling, are the Resource Conservation and Recovery Act (RCRA), which is discussed in Section 8.13, Waste Management, and the Occupational Safety and Health Act, which is discussed in Section 8.7, Worker Health and Safety.

**8.12.2.1.4 Natural Gas Pipeline Construction and Safety.** Title 40 of the Code of Federal Regulations, parts 190 through 192, specifies safety and construction requirements for natural gas pipelines. Part 190 outlines pipeline safety procedures, Part 191 requires a written report for any reportable incident, and Part 192 specifies minimum safety requirements for pipelines.

## 8.12.2.2 State

California laws and regulations relevant to hazardous materials handling at the facility include Health and Safety Code Section 25500 (hazardous materials), Health and Safety Code 25531 (regulated substances), and the Aboveground Petroleum Storage Act (petroleum in aboveground tanks).

**8.12.2.2.1 Health and Safety Code Section 25500.** California Health and Safety Code, Section 25500, et seq., and the related regulations in 19 California Code of Regulations (CCR) 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency (CUPA) and to report releases to their CUPA and the State Office of Emergency Services. The threshold quantities for hazardous materials are 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet for compressed gases measured at standard temperature and pressure.

**8.12.2.2.2 Health and Safety Code Section 25531 (California Accidental Release Program).**

California Health and Safety Code, Section 25531, et seq., and the California Accidental Release Program (CalARP) regulate the registration and handling of regulated substances. Regulated substances are any chemicals designated as an extremely hazardous substance by the U. S. Environmental Protection Agency (USEPA) as part of its implementation of Superfund Amendments and Reauthorization Act (SARA) Title III. Health and Safety Code Section 25531 overlaps or duplicates some of the requirements of SARA and the CAA. Facilities handling or storing regulated substances at or above TPQs must register with their local CUPA and prepare an RMP, formerly known as a Risk Management and Prevention Program (RMPP). The CalARP is found in Title 19, CCR, Chapter 4.5. The TPQ for ammonia is 500 pounds. Portions of the aqueous ammonia process that can be demonstrated to have a partial pressure of the regulated substance in the mixture (solution), under the handling or storage conditions, which is less than 10 millimeters of mercury (mm Hg) does not count toward the threshold.

**8.12.2.2.3 Aboveground Petroleum Storage Act.** Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal CWA. The law applies to facilities that operate a petroleum AST with a capacity greater than 660 gallons or combined ASTs capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in “harmful quantities” into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a SPCC plan.

**8.12.2.2.4 Safe Drinking Water and Toxics Enforcement Act (Proposition 65).** This law identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the chemicals of concern are published and updated periodically. The Act is administered by California’s Office of Environmental Health Hazard Assessment. Some of the chemicals to be used at the facility are on the cancer-causing and reproductive-toxicity lists of the Act.

**8.12.2.2.5 Natural Gas Pipeline Construction and Safety.** The California Public Utilities Commission enforces General Order No. 58-A specifying standards for natural gas service in the State of California, and General Order No. 112-E specifying rules governing the design, construction, testing, operation, and maintenance of natural gas gathering, transmission, and distribution piping systems.

**8.12.2.3 Local**

The City and County of San Francisco (CCSF) have the responsibility for administering hazardous materials requirements and ensuring compliance with federal and state laws in San Francisco.

**8.12.2.3.1 Hazardous Materials Storage and Handling.** The requirements for hazardous materials handling are specified in the San Francisco Public Health Code, enforced by the San Francisco Department of Public Health (SFDPH), Environmental Health Section. Article 21 incorporates the California Underground Storage Tank Regulations (California H&S Code, Chapters 6.7 and 6.75), Hazardous Materials Release Response Plans and Inventory Regulations requiring preparation of a Hazardous Materials Business Plan (HMBP) (California H&S Code, Chapter 6.95, Article 1), Aboveground Petroleum Storage Tank Regulations requiring preparation of a SPCC plan (California H&S Code, Section 25270.5), and hazardous materials management provisions of the Uniform Fire Code

requiring Hazardous Materials Inventories (Uniform Fire Code, Sections 8001.3.2[a] and 8001.3.3[a]). It also provides for additional stricter local requirements. Article 21 also requires conformance with applicable hazardous materials requirements of the San Francisco Building Code, Electric Code, Public Works Code, Fire Code and City Planning Code. Article 80 of the San Francisco Fire Code incorporates the hazardous materials handling requirements of the Uniform Fire Code, discussed below, and is enforced by the San Francisco Fire Department.

**8.12.2.3.2 Regulated Substances Handling.** The requirements for handling of regulated substances, including the preparation of an RMP, are specified in Article 22A of the San Francisco Public Health Code, enforced by the SFPDPH. This article incorporates the requirements of CalARP, described above.

#### 8.12.2.4 Codes

The design, engineering, and construction of hazardous materials storage and dispensing systems will be in accordance with all applicable codes and standards, including the following:

- California Vehicle Code, 13 CCR 1160, et seq. — Provides the California Highway Patrol (CHP) with authority to adopt regulations for the transportation of hazardous materials in California.
- The California Fire Code, Articles 79 and 80 — The hazardous materials sections of the Fire Code. Local fire agencies or departments enforce this code and can require that an HMBP and a Hazardous Materials Inventory Statement be prepared. This requirement and the requirement for an HMBP can usually be satisfied in a single combined document. San Francisco adopted these articles of the California Fire Code into its municipal code in 1999. The California Fire Code is based on the Federal Fire Code.
- State Building Standard Code, Health and Safety Code Sections 18901 to 18949 — Incorporates the UBC, Uniform Fire Code, and Uniform Plumbing Code.
- The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section VIII.
- The American National Standards Institute (ANSI) K61.1.

#### 8.12.3 Affected Environment

The project site is located in the City of San Francisco, adjacent to San Francisco Bay (see Figure 2-1). Land use in the surrounding area (discussed in detail in Subsection 8.4, Land Use) is primarily industrial and commercial with some associated residential. Sensitive receptors within a 3-mile radius of the project site include 70 schools, 48 day care facilities, 22 hospitals or long-term health care facilities, and 49 parks and recreation centers. These receptors are listed in Table 8.12-2 and shown on Figure 8.6-1. The closest of these receptors is the Warm Water Cove Public Access area, a park located approximately 300 feet south of the project site. The nearest school is Daniel Webster Elementary School located approximately 3,000 feet to the northwest. The nearest day care facility is San Francisco Head Start, located approximately 4,000 feet to the west. The nearest hospital/long-term health care facility is the San Francisco General Hospital located approximately 5,300 feet to the west.



The nearest residence is located on Third Street between 22nd and 23rd streets, approximately 600 feet northwest of the project site.

TABLE 8.12-2  
Sensitive Land Uses Within 3 Miles of the Proposed Project

<b>Day Care Facilities</b>			
1	San Francisco Head Start	25	Children's Council of San Francisco
2	Friends of Potrero Hill Nursery	26	Olive Street Head Start
3	Love & Learn Nursery School	27	Alfa Da Developmental Center
4	San Francisco Southeast Headstart	28	True Sunshine Pre-School Center
5	Kiddieland Happy Face Place	29	Wind in the Willows Inc.
6	Mission Head Start	30	Noe Valley Nursery School
7	San Francisco Head Start	31	San Francisco School
8	Marin Day Schools	32	Kinderhaven Children's Center
9	Compañeros Del Barrio Pre-School	33	Economic Opportunity Council
10	Lucy Harber Academy	34	Montessori House of Children
11	Marin Day Schools	35	Littlest Angel Prep Pre-School
12	EOC Head Start	36	Audrey L. Smith Development Center Inc.
13	Big City Montessori School	37	Kai Ming Headstart
14	Buena Dia Family School – Preschool	38	Excelsior Cooperative Pre-School
15	Golden Gate Head Start	39	Phoebe Hearst Pre-School
16	Marin Day Schools	40	Twelve Hugs Children's Center
17	YMCA – 44 Montgomery Street #770	41	YMCA – 4080 Mission Street
18	Chinese American International School	42	Fellowship Academy & Pre-School
19	Katherine Michiels School	43	Eben Ezer Family Day Care
20	International Christian School	44	M'Eadd Preparatory Day Care
21	Children's Day School	45	Cyo Mission Day Care
22	Holy Family Day Home	46	Holy Family Day Home Bus Office
23	Little Bear School	47	Laura's Day Care
24	Trevor Martin Montessori School	48	Peppertree Day Care & Pre-School
<b>Schools</b>			
1	John Chin Yehall	36	Cesar Chavez Elementary
2	Chinese Education Elementary Center	37	George R. Mascone Elementary
3	Notre Dame Victories Elementary	38	Saint Peter Elementary
4	San Francisco Chinese Parent Community Elementary	39	Bryant Elementary
5	Commodore Stockton Elementary	40	Buena Vista Annex
6	Cathedral School for Boys	41	Starr King Elementary
7	Redding Elementary	42	Leonard Flynn Elementary
8	Bessie Carmichael Elementary	43	St. Antony Elementary
9	Saint Joseph Elementary	44	Immaculate Conception Elementary

TABLE 8.12-2

## Sensitive Land Uses Within 3 Miles of the Proposed Project

10	Sacred Heart Cathedral Prep High School	45	Saint Paul High School
11	John Swett Elementary	46	Mission Education Center
12	Ida B. Wells High School	47	Fairmount Elementary
13	Sacred Heart Grammar Elementary	48	St. John the Evangelist Elementary
14	John Muir Elementary	49	St. John the Evangelist High School
15	French-American International Elementary	50	Paul Revere Elementary
16	French-American International High School	51	Paul Revere Annex
17	First Baptist Church School	52	Thurgood Marshall Academic High School
18	M.C. Kinley Elementary	53	San Francisco Montessori
19	Sanchez Elementary	54	Cornerstone Academy Baptist School
20	Everett Middle School	55	Hilcrest Elementary
21	Mission Dolores Elementary School	56	Bridgemont High School
22	Marshal Elementary	57	Saint Elizabeth Elementary School
23	Mission High School	58	Edward R. Taylor Elementary
24	Saint Charles Borromeo School	59	Martin Luther King Academy Middle School
25	International Studies Academy	60	Saint Paul of the Shipwreck Academy
26	Potrero Middle School	61	El Dorado Elementary
27	Daniel Webster Elementary	62	Philip & Sala Burton High School
28	Harvey Mild Elementary	63	Charles R. Drew Elementary
29	Alvarado Elementary	64	George Washington Carver Elementary
30	Saint Phillip Elementary	65	Gloria B. Davis Middle School
31	Edison Elementary	66	Malcom X Elementary
32	Saint James Elementary	67	James Lick Middle
33	Saint Paul Elementary	68	Immaculate Conception Academy High School
34	Horace Mann Middle	69	Bret B. Harte Elementary
35	Downtown Continuation High School	70	Junipero Serra Elementary School

**Hospitals/Long-Term Health Care Facilities**

1	Chinese Hospital	12	Granada Senior Home
2	Saint Francis Memorial	13	Lades of Perpetual Help
3	Davies Medical Center	14	Morning Star
4	San Francisco General Hospital	15	Obdulia's Rest Home
5	Saint Lukes Hospital	16	Richard M. Cohen Residence
6	Sheffield Convalescent Hospital	17	Sunnyside Retirement Hacienda
7	Andrews Boarding & Care Home	18	Synergy LLC
8	Belen's Residential Care Home for the Elderly	19	University Mound Ladies Home
9	Bernal Heights Retirement Home	20	Central Gardens Convalescent Center
10	Coventry Park	21	Nob Hill Healthcare Center

TABLE 8.12-2  
Sensitive Land Uses Within 3 Miles of the Proposed Project

11	The Granada Hotel	22	The Sequoias – San Francisco
<b>Parks</b>			
1	Justin Herman Plaza	26	Garfield Square
2	Portsmouth Square	27	Precita
3	Union Square	28	Bernal Heights
4	Yerba Buena Gardens	29	Juri Street
5	South Park	30	Upper Noe Recreation Center
6	South of Market Park	31	Fairmount Plaza
7	Boeddeker Park	32	Billy Goat Hill
8	Jefferson Square	33	Walter Hass
9	Hayward Playground	34	Holly Park
10	Koshland	35	Saint Mary's
11	O'Farrell Street Park	36	Silver Terrace Playground
12	Alamo Square	37	Portola Recreation Center
13	Duboce	38	John Maclaren
14	Corona Heights Playground	39	Bayview Playground
15	Mission Dolores	40	Youngblood Coleman Playground
16	Mission Playground	41	Hilltop
17	Eureka Valley Recreation Center	42	Adams Rogers
18	Folsom	43	India Basin Shoreline Playground
19	Franklin Square	44	Bayview
20	Jackson Playground	45	Gilman
21	Aqua Vista Park	46	3 COM PARK
22	McKinley Square	47	Warm Water Cove Public Access Area
23	Potrero Hill Recreation Center	48	Islais Creek Public Access Area
24	Potrero del Sol	49	Heron's Head Park
25	Rolph Play Ground		

Source: Dames and Moore, 2000.

The area potentially affected by any release of aqueous ammonia in excess of 75 ppm would not extend more than 90 feet eastward from the tank, just over the project fence line, as discussed in Subsection 8.12.5, Offsite Migration Modeling (releases to the north, south, and western boundaries of the SFERP will not exceed a concentration of 5 ppm). This will affect only the existing Potrero PP facility operated by Mirant, which is inaccessible to the general public. Because there are no schools, hospitals, day-care facilities, emergency response facilities or long-term health care facilities located within the area potentially affected by any release of hazardous materials, the figure required by CEC Siting Regulations, Title 20, Division 2, Chapter 5, Appendix B (g) (10) (B) would be equivalent to Figure 8.6-1, which shows the project site and surrounding area on a map at a scale 1:24,000.

## 8.12.4 Potential Environmental and Human Health Effects

Construction and operation of the project will involve the use of various hazardous materials and one regulated substance. The potential environmental and human health impacts related to the use of these materials are discussed in this section.

### 8.12.4.1 Construction Phase

The quantities of hazardous materials that will be onsite during construction are small relative to the quantities used during operation. They will be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

Use of these materials during construction will not present a public health risk because the use would be subject to the requirements of Article 21 of the San Francisco Health Code, described further in Subsection 8.12.8.2.1, and because there is a negligible chance that surface water or groundwater could be affected. The project site is largely composed of impervious surfaces, and all stormwater drains to the City's combined sewer system (see Subsection 8.14, Water Resources). During construction, the contractor will be required to implement control measures including best management practices that prevent sediment and stormwater contamination from spills or leaks, control the amount of runoff from the site, and require proper disposal or recycling of hazardous materials. Implementation of these measures during construction will minimize the potential for release of construction-related fuels and other hazardous materials entering the stormwater and draining to the combined sewer system. Stormwater combined with sewage in the combined sewer system receives treatment as discussed in Subsection 8.14, Water Resources. Treated wastewater from the combined sewer system for eventual discharge into the San Francisco Bay is subject to the requirements of the NPDES permit issued by the San Francisco Bay Regional Water Quality Control Board. Through compliance with these requirements, potential environmental effects from the use of hazardous materials during construction are less than significant. In addition, the hazardous materials used during construction will be registered with the SFDPH in accordance with Article 21 of the San Francisco Public Health Code if threshold quantities of storage are exceeded.

Regulated substances, as defined in California's Health and Safety Code, Section 25531, will not be used during construction of the project. Therefore, no discussion of regulated substances storage or handling is included in this subsection.

### 8.12.4.2 Operations Phase

Storage locations for the hazardous materials that will be used during operation are described in Table 8.12-3. Table 8.12-4 presents information about these materials, including trade names, chemical names, Chemical Abstract Service (CAS) numbers, maximum quantities onsite, RQs, CalARP TPQs, and status as a Proposition 65 chemical (a chemical known to be carcinogenic or cause reproductive problems in humans). Health hazards and flammability data are summarized for these materials in Table 8.12-5, which also contains information on incompatible chemicals (e.g., sodium hypochlorite and ammonia).

A maximum of approximately 38,815 gallons and 100 pounds of hazardous materials and regulated substances will be stored for the project. Most of the hazardous substances that will be used by the project are required for treatment and laboratory analysis of the cooling water, facility maintenance, and lubrication of equipment, or would be contained within transformers and electrical switches. The only regulated substance that will be used for the project is aqueous ammonia; toxicity characteristics and the exposure level criteria for ammonia are included in Table 8.12-6. Alternatives to the use of the 29 percent solution of aqueous ammonia were considered, as discussed in Section 9 (Alternatives) and no feasible alternatives were identified. The use of ammonia generation technologies (urea to ammonia) are not feasible for this project as these processes require steam to be available on the project site and the SFERP project will not be generating steam. Furthermore, these technologies have not been installed on peaking units. The SFERP facility will store the 29-percent aqueous ammonia solution in a single stationary aboveground storage tank. The capacity of the tank will be approximately 12,000 gallons and the maximum quantity onsite will not exceed approximately 10,000 gallons. The tank will be surrounded by a secondary containment structure capable of holding the full contents of the tank, approximately 665 square feet (38 feet by 17.5 feet). The floor of the secondary containment structure will drain to a 24-inch-diameter drain line that will lead to an underground spill containment vault (14 feet by 18 feet by 6 feet).

Aqueous ammonia will be delivered to the plant by truck transport. The truck loading area will be located within a bermed area adjacent to the storage tank. The floor of the loading area will be sloped to drain into the spill containment vault through an underground 4-inch drain line. The use of 29 percent aqueous ammonia will require approximately 14 deliveries of ammonia per year. Use of lower concentrations of aqueous ammonia would require more frequent delivery but would not significantly reduce the risk of offsite releases. The results of an Offsite Consequences Analysis presented in Subsection 8.12.5 show that release of a 29 percent solution of aqueous ammonia under a worst-case scenario will not cause significant offsite impacts to public health or safety.

If a chemical release were to occur without proper controls in place, the public could be exposed to harmful vapors, and incompatible chemicals could mix, causing vapors that could also potentially have harmful effects. In addition, an uncontrolled release of liquid chemicals could run off and drain into the combined sewer system and potentially degrade water quality. However, the California Fire Code, Articles 79 and 80, includes specific requirements for the safe storage and handling of hazardous materials that would reduce the potential for a release of hazardous materials, and mixing of incompatible materials.

The design of the project will incorporate state-of-the-art chemical storage and handling facilities in compliance with the current California Fire Code and other applicable federal, state, and local regulations as discussed in Subsection 8.12.8.2.1. As discussed in that section, the City will also be required to prepare an HMBP for the storage and handling of hazardous materials at the SFERP site. The plan will incorporate City emergency response procedures for hazardous materials incidents specified in the San Francisco Area Plan for Hazardous Materials Incidents. In accordance with the Aboveground Petroleum Storage Act, the aboveground petroleum storage will also be subject to the Act and an SPCC plan specifying methods to prevent and contain a spill would be prepared as discussed in Subsection 8.12.8.2.3.

**TABLE 8.12-3**  
Storage Location and Use of Hazardous Materials During Project Operation

<b>Chemical</b>	<b>Use</b>	<b>Storage Location</b>	<b>State</b>	<b>Type of Storage</b>
Aqueous Ammonia (29% NH <sub>3</sub> by weight)	Control oxides of nitrogen (NO <sub>x</sub> ) emissions as part of selective catalytic reduction system	East and adjacent to treated water storage tank	Liquid	Continuously Onsite
Aluminum Sulfate, Sodium Aluminate	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Antiscalant	Prevent scale in reverse osmosis membranes	Water treatment building	Liquid	Continuously Onsite
Citric Acid (50%)	pH control of upstream of reverse osmosis equipment	Wastewater Treatment building	Liquid	Continuously Onsite
Cleaning Chemicals/Detergents	Periodic cleaning	Shop/warehouse area	Liquid	Continuously Onsite
Coagulant Aid Polymer (e.g., NALCO NALCOLYTE 8799)	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Corrosion Inhibitor (NALCO 8305 Plus)	Cooling tower cooling water corrosion inhibitor	Near chiller cooling tower	Liquid	Continuously Onsite
Dispersant (NALCO TRASAR 23263)	Cooling tower cooling water dispersant	Near chiller cooling tower	Liquid	Continuously Onsite
Ferric Chloride or Ferric Sulfate	Coagulant for plant makeup water	Water treatment building	Liquid	Continuously Onsite
Laboratory Reagents	Water/wastewater laboratory analysis	Water treatment building	Liquid and Granular Solid	Continuously Onsite
Synthetic Turbine Lubricating Oil	Lubricate rotating equipment (e.g., gas turbine lube oil systems)	Contained within storage tanks on equipment skids	Liquid	Continuously Onsite
Mineral Generator Lubricating Oil	Lubricate rotating equipment (e.g., generator lube oil systems)	Contained within storage tanks on equipment skids	Liquid	Continuously Onsite
Mineral Transformer Insulating Oil	Transformers/switchyard	Contained within transformers and electrical switches	Liquid	Continuously Onsite
Scale Inhibitors (Polyacrylate)	Cooling tower scale inhibitor	Near chiller cooling towers	Liquid	Continuously Onsite

**TABLE 8.12-3**  
Storage Location and Use of Hazardous Materials During Project Operation

<b>Chemical</b>	<b>Use</b>	<b>Storage Location</b>	<b>State</b>	<b>Type of Storage</b>
Sodium Bisulfite (38-70%, NALCO 7804)	Remove free chlorine in reclaimed water upstream of reverse osmosis system and wastewater treatment	Water treatment building and wastewater treatment building	Liquid	Continuously Onsite
Sodium Bromide (NALCO STABREX ST40)	Cooling tower biocide and process water pretreatment	Near chiller cooling towers and water treatment building	Liquid	Continuously Onsite
Sodium Hydroxide (50% Caustic)	pH control upstream of reverse osmosis equipment and wastewater treatment	Water treatment building and wastewater treatment building	Liquid	Continuously Onsite
Sodium Hypochlorite (10.3 - 12% NaOCl)	Biocide to treat inlet reclaimed water/ cooling tower biocide and process water pretreatment /and wastewater treatment	Water treatment building/ near chiller cooling tower/ wastewater treatment building	Liquid	Continuously Onsite
Sulfuric Acid (93 - 98%)	Enhance back flush of ultra filter system/ cooling tower cooling water pH control	Water treatment building/ near chiller cooling tower	Liquid	Continuously Onsite

TABLE 8.12-4  
Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ <sup>a</sup>	RQ of Material as Used Onsite <sup>b</sup>	LaFollette Bill TPQ <sup>c</sup>	Prop 65
<b>Regulated Substances</b>							
Aqueous Ammonia (29% solution)	Ammonium Hydroxide	1336-21-6 (for NH <sub>3</sub> -H <sub>2</sub> O)	10,000 gal.	100 lb	500 lb	500 lb	No
<b>Hazardous Materials</b>							
Aluminum Sulfate <sup>d</sup>	Aluminum Sulfate	10043-01-3	800 gal.	5,000 lb	5,000 lb	<sup>e</sup>	No
Sodium Aluminate <sup>d</sup>	Sodium Aluminate	1302-42-7	400 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Antiscalant	Anti-scalant	None	200 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Citric Acid	Citric Acid (50 percent)	77-92-9	100 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Cleaning Chemicals/Detergents	Various	None	20 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Coagulant Aid Polymer (e.g. NALCO NALCOLYTE 8799)	Sodium Chloride	7647-14-5	400 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
	Polyquaternary Amine	20507700000-5062P		<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	
Corrosion Inhibitor (NALCO 8305 Plus)	Cooling tower cooling water corrosion inhibitor	None	200 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Dispersant (NALCO TRASAR 23263)	Cooling tower cooling water dispersant	64665-57-2	200 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Ferric Chloride <sup>d</sup>	Ferric Chloride	7705-08-0	400 gal.	1,000 lb	1,000 lb	<sup>e</sup>	No
Ferric Sulfate <sup>d</sup>	Ferric Sulfate	10028-22-5	400 gal.	1,000 lb	1,000 lb	<sup>e</sup>	No
Laboratory Reagents (liquid)	Various	None	20 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Laboratory Reagents (solid)	Various	None	100 lb	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Synthetic Turbine Lubrication Oil	Oil	None	560 gal.	42 gal. <sup>f</sup>	<sup>g</sup>	<sup>e</sup>	Yes
Mineral Generator Lubrication Oil	Oil	None	1,570 gal.	42 gal. <sup>f</sup>	<sup>g</sup>	<sup>e</sup>	Yes



**TABLE 8.12-4**  
**Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities**

Trade Name	Chemical Name	CAS Number	Maximum Quantity Onsite	CERCLA SARA RQ <sup>a</sup>	RQ of Material as Used Onsite <sup>b</sup>	LaFollette Bill TPQ <sup>c</sup>	Prop 65
Mineral Transformer Insulating Oil	Oil	8012-95-1	21,000 gal.	42 gal. <sup>f</sup>	<sup>g</sup>	<sup>e</sup>	Yes
Scale Inhibitors (various)	Polyacrylate	Various	400 gal.	<sup>e</sup>	<sup>e</sup>	<sup>e</sup>	No
Sodium Bisulfite (NALCO 7804)	Sodium Bisulfite (38 to 70 percent)	7631-90-5	450 gal.	5,000 lb	7,143 lb	<sup>e</sup>	No
Sodium Bromide (NALCO STABREX ST40)	Sodium Hydroxide (1 to 5 percent)	1310-73-2	200 gal.	1,000 lb	20,000 lb	<sup>e</sup>	No
Sodium hydroxide (caustic)	Sodium Hydroxide (50 percent)	1310-73-2	425 gal.	1,000 lb	20,000 lb	<sup>e</sup>	No
Sodium Hypochlorite (Bleach)	Sodium Hypochlorite (10.3-12 percent)	7681-52-9	870 gal.	100 lb	1,000 lb	<sup>e</sup>	No
Sulfuric Acid	Sulfuric Acid (93 – 98 percent)	7664-93-0	400 gal.	1,000 lb	1,075 lb	<sup>e</sup>	No

<sup>a</sup> Reportable quantity for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [Ref. 40 CFR 302, Table 302.4]. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

<sup>b</sup> Reportable quantity for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of a reportable chemical, the reportable quantity of the mixture can be different than for a pure chemical. For example, if a material only contains 10 percent of a reportable chemical and the RQ is 100 lb, the reportable quantity for that material would be (100 lb)/(10%) = 1,000 lb.

<sup>c</sup> Threshold Planning Quantity [Ref. 40 CFR Part 355, Appendix A]. If quantities of extremely hazardous materials equal to or greater than TPQ are handled or stored, they must be registered with the local Administering Agency.

<sup>d</sup> Some of the chemicals have alternatives (See Table 8.12-1), thus the maximum quantity stored onsite can be zero if an alternative chemical is being used.

<sup>e</sup> No reporting requirement. Chemical has no listed RQ or TPQ.

<sup>f</sup> State reportable quantity for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)].

<sup>g</sup> Per the California Regional Water Quality Control Board, Region 2, they would like all oil spills to surface water reported, even for less than the state reportable quantity of 42 gal.

TABLE 8.12-5  
Toxicity, Reactivity, and Flammability of Hazardous and Regulated Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
<b>Regulated Substances</b>				
Aqueous Ammonia	Liquid, vapor is colorless gas with pungent odor	Corrosive: Irritation to permanent damage from inhalation, ingestion, and skin contact	Acids, halogens (e.g., chlorine), strong oxidizers, salts of silver and zinc	Liquid is incombustible; vapor is combustible, but difficult to burn
<b>Hazardous Materials</b>				
Aluminum Sulfate	Liquid	Toxic: Moderately toxic by ingestion	None	Nonflammable
Sodium Aluminate	Straw-colored liquid	Strong irritant to tissue	Acids and strong oxidizing agents	Nonflammable
Antiscalant	Amber liquid	May cause slight irritation to the skin and moderate irritation to the eyes	None	Nonflammable
Citric Acid	Colorless translucent crystals	Skin and mucous membrane irritant and severe eye irritant	Strong bases and oxidizing agents	Nonflammable
Cleaning Chemicals/Detergents	Liquid	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Coagulant Aid Polymer (e.g. NALCO NALCOLYTE 8799)	Light yellow liquid	May cause irritation to skin and eyes with prolonged contact	Strong oxidizers	Nonflammable
Corrosion Inhibitor (NALCO 8305 Plus)	Light yellow liquid, sweet organic odor	Irritant to eyes, skin, and respiratory tract	Strong oxidizers, strong acids, and reactive metals	Nonflammable
Dispersant (NALCO TRASAR 23263)	Clear amber liquid	None	None	Nonflammable
Ferric Chloride	Clear, yellow-orange liquid	Corrosive: Causes burns to eyes and skin; ingestion may cause stomach pain, nausea, vomiting, shock, and diarrhea	Heat and evaporation	Nonflammable

TABLE 8.12-5  
Toxicity, Reactivity, and Flammability of Hazardous and Regulated Substances Stored Onsite

Hazardous Materials	Physical Description	Health Hazard	Reactive & Incompatibles	Flammability*
Ferric Sulfate	Dark reddish-brown solution with mild odor	Corrosive: May cause irritation to mucous membranes, respiratory tract and lung tissue if inhaled or burns to skin and eyes; ingestion can cause stomach irritation, digestive tract burns, liver cirrhosis and fibrosis of pancreas	Cast iron/bronze, brass, 304ss, hastelloy B, copper and alloys, galvanized steel, aluminum, paints, enamels, and concrete	Nonflammable
Laboratory Reagents	Liquid and solid	Refer to individual chemical labels	Refer to individual chemical labels	Refer to individual chemical labels
Lubrication Oil	Oily, dark liquid	Hazardous if ingested	Sodium hypochlorite	Flammable
Mineral Insulating Oil	Oily, clear liquid	Minor health hazard	Sodium hypochlorite	Can be combustible, depending on manufacturer
Scale Inhibitors (Polyacrylate)	Yellow green liquid	Corrosive and Toxic: Slight to moderate toxicity; irritation to skin and eyes	Strong acids	Nonflammable
Sodium Bisulfite	Yellow liquid	Corrosive: Irritation to eyes, skin, and lungs; may be harmful if digested	Strong acids and strong oxidizing agents	Nonflammable
Sodium Bromide	White crystals, granules, or powder; odorless	Causes irritation to skin, eyes, and respiratory tract; can cause damage to central nervous system if ingested	Acids, alkaloidal and heavy metal salts, oxidizers, and bromine trifluoride	Nonflammable
Sodium Hydroxide	Clear yellow liquid	Corrosive: Irritant to tissue in presence of moisture; strong irritant to tissue by ingestion	Water, acids, organic halogens, some metals	Nonflammable
Sodium Hypochlorite (Bleach)	Pale green; sweet, disagreeable odor. Usually in solution with H <sub>2</sub> O or sodium hydroxide	Corrosive and Toxic: Toxic by ingestion; strong irritant to tissue	Ammonia and organic materials	Fire risk when in contact with organic materials
Sulfuric Acid	Colorless, dense, oily liquid	Strongly Corrosive: Strong irritant to all tissue; minor burns to permanent damage to tissue	Organic materials, chlorates, carbides, fulminates, metals in powdered form; reacts violently with water	Nonflammable

Data were obtained from Material Safety Data Sheets (MSDSs) and Lewis, 1991.

\* Per Department of Transportation regulations, under 49 CFR 173: "Flammable" liquids have a flash point less than or equal to 141° F; "Combustible" liquids have a flash point greater than 141° F.

TABLE 8.12-6  
Toxic Effects and Exposure Levels of Regulated Substances

Name	Toxic Effects	Exposure Levels-Pure NH <sub>3</sub>
Aqueous Ammonia (29 percent solution)	Toxic effects for contact with pure liquid or vapor causes eye, nose, and throat irritation, skin burns, and vesiculation. Ingestion or inhalation causes burning pain in mouth, throat, stomach, and thorax, constriction of thorax, and coughing followed by vomiting blood, breathing difficulties, convulsions, and shock. Other symptoms include dyspnea, bronchospasms, pulmonary edema, and pink frothy sputum. Contact or inhalation overexposure can cause burns of the skin and mucous membranes, headache, salivation, nausea, and vomiting. Other symptoms include labored breathing, bloody mucous discharge, bronchitis, laryngitis, hemmoptysis, and pneumonitis. Damage to eyes may be permanent, including ulceration of conjunctiva and cornea and corneal and lenticular opacities.	Occupational Exposures: PEL = 35 mg/m <sup>3</sup> OSHA TLV = 18 mg/m <sup>3</sup> ACGIH TWA = 25 mg/m <sup>3</sup> NIOSH STEL = 35 mg/m <sup>3</sup> Hazardous Concentrations: IDLH = 500 ppm LD <sub>50</sub> = 350 mg/kg – oral, rat ingestion of 3 to 4 ml may be fatal Sensitive Receptors: ERPG-1 = 25 ppm ERPG-2 = 200 ppm ERPG-3 = 1,000 ppm
ACGIH	American Conference of Government Industrial Hygienists	
ERPG	Emergency Response Planning Guideline	
ERPG-1	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient adverse health effects	
ERPG-2	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without developing irreversible or serious health effects	
ERPG-3	Maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing life-threatening health effects	
IDLH	Immediately dangerous to life and health	
LD <sub>50</sub>	Dose lethal to 50 percent of those tested	
LDLO	Lowest published lethal dose	
mg/kg	Milligrams per kilogram	
mg/m <sup>3</sup>	Milligrams per cubic meter	
NIOSH	National Institute of Occupational Safety and Health	
PEL	Occupational Safety and Health Administration (OSHA) permissible exposure limit for 8-hr workday	
ppm	parts per million	
STEL	Short-term exposure limit, 15-min. exposure	
TCLO	Lowest published toxic concentration	
TLV	ACGIH threshold limit value for 8-hr workday	
TWA	NIOSH time-weighted average for 8-hr workday	

Because of its classification as a regulated substance, an accidental release of the 29 percent aqueous ammonia could present the most likely potential for effects on the environment and/or human health of all the chemicals used at the site. Pure ammonia (NH<sub>3</sub>) is a volatile, regulated substance that is very soluble in water. Aqueous ammonia consists of a solution of ammonia and water. If the aqueous ammonia solution were to leak or be released without proper controls, the ammonia in solution could escape or evaporate as a gas into the atmosphere.

Ammonia gas can be toxic to humans at sufficient concentrations. Potential toxic effects of ammonia and acceptable exposure levels are summarized in Table 8.12-6. The odor threshold of ammonia is about 5 ppm, and minor irritation of the nose and throat will occur at 30 to 50 ppm. Ammonia concentrations greater than 140 ppm will cause detectable effects on lung function even for short-term exposures (0.5 to 2 hours). At higher concentrations of 700 to 1,700 ppm, ammonia gas will cause severe effects; death occurs at concentrations of 2,500 to 6,000 ppm (Smyth, 1956).

Storage and use of ammonia would be subject to the requirements of the California Fire Code, Article 80, described in Subsection 8.12.8.2.1, as well as the CalARP, described in Subsection

8.12.8.2.3. Article 80 of the California Fire Code contains specific requirements for control of liquid and gaseous releases of hazardous materials. Secondary containment in the form of an underground spill containment vault, as described earlier in Subsection 8.12.4.2, will be provided for the ammonia storage tank and loading area. In addition, the facility will be required to prepare an RMP in accordance with the CalARP, further specifying safe handling procedures for the ammonia as well as emergency response procedures in the event of an accidental release.

Sulfuric acid is also identified as a regulated substance under the CalARP program, but only if it is concentrated with greater than 100 pounds of sulfur trioxide, if it meets the definition of oleum, or if it is stored in a container with flammable hydrocarbons. The sulfuric acid that will be used at the facility meets none of these criteria. Therefore, sulfuric acid is not subject to CalARP requirements.

With construction in accordance with applicable laws and regulations, provision of secondary containment for storage and loading facilities, preparation of a HMBP, preparation of a SPCC plan, and preparation of an RMP, discussed in Subsections 8.12.8.2.1 through 8.12.8.2.3, potential public health and environmental impacts related to the use of hazardous materials and regulated substances are less than significant.

### 8.12.5 Offsite Migration Modeling

Because there is human activity in the vicinity of the proposed site, a vulnerability analysis was performed to assess the risk to humans from the site if a spill or rupture of the aqueous ammonia storage tank were to occur. Dispersion modeling was conducted using the SLAB numerical dispersion model (LLNL, 1990).

The worst-case accidental release scenario assumed the aqueous ammonia storage tank was punctured and the entire contents was spilled into a catch basin or bermed area located beneath the tank. An initial ammonia emission rate for an evaporating pool of 29 percent aqueous ammonia solution was calculated pursuant to the guidance given in *RMP Offsite Consequence Analysis Guidance*, EPA, April 1999 and using the “evaporation calculator” provided by the National Oceanic and Atmospheric Administration (<http://response.restoration.noaa.gov/cameo/evapcalc/evap.html#>). Release rates for ammonia vapor from an evaporating 29-percent solution of aqueous ammonia were calculated assuming mass transfer of ammonia across the liquid surface occurs according to principles of heat transfer by natural convection. The ammonia release rate was calculated using the evaporation calculator, meteorological data listed below and the dimensions of the secondary containment area. The offsite consequence analysis is provided as Appendix 8.12A.

An initial ammonia evaporation rate was calculated and assumed to occur for at least one hour. For concentrated solutions, the initial evaporation rate is substantially higher than the rate averaged over time periods of a few minutes or more since the concentration of the solution immediately begins to decrease as evaporation begins. Parameters used to calculate the initial ammonia emission rate include an atmospheric stability classification of “F,” a wind speed of 1.5 meters/second and a temperature of 97 degrees Fahrenheit (°F). Using these parameters, the ammonia plume was predicted to extend approximately 26.19 meters (86 feet) at ground level from the ammonia storage tank at a concentration of 200 ppm. At a

concentration of 75 ppm, the distance was 27.22 meters (<90 feet) from the tank at ground level. The assumptions used in this analysis include the following:

- A total mass release of 3,413 pounds of ammonia is assumed to occur over 1 hour, representing an evaporating pool of 10,000 gallons of a 29 percent ammonia solution
- An ammonia storage temperature of 97°F (highest temperature recorded at San Francisco International Airport [SFO] over the past 3 years)
- A diked area of 665 square feet (17.5 feet wide by 38 feet long)
- A roughness length of 0.4 meters, representing an urban, industrial area.

Based on this conservative modeling analysis, the worst case accident is not expected to result in an offsite release greater than 5 ppm to the north, south, or west of the site. Thus, offsite concentrations in publicly accessible areas will be below 75 ppm. Offsite concentrations of 300 ppm could occur to the east of the site on the existing Mirant private property. Since the general public will not be exposed to ammonia concentrations above 75 ppm during a worst-case release scenario, the storage of aqueous ammonia onsite will not pose a significant risk to the public.

### 8.12.6 Fire and Explosion Risk

Table 8.12-5 describes the flammability for the hazardous materials that will be onsite. With the exception of ammonia and lubricating oils, all hazardous materials are nonflammable. Article 80 of the California Fire Code requires all hazardous materials storage areas to be equipped with a fire extinguishing system and also requires ventilation for all enclosed hazardous material storage areas.

Aqueous ammonia, which constitutes the largest quantity of hazardous materials onsite (except for the oil contained in the equipment) and is the only chemical classified as a regulated substance, is incombustible in its liquid state. Under normal storage conditions, ammonia would not evaporate to the atmosphere because it would be contained within a totally enclosed system equipped with ventilation as required by Article 80 of the California Fire Code and described in Subsection 8.12.8.2.2. In the unlikely event that a release were to occur, ammonia could evaporate as a vapor. Ammonia vapor is combustible only within a narrow range of concentrations in air. The evaporation rate of aqueous ammonia is sufficiently low that the lower explosion limit (LEL) will not be reached. The lubrication oil is flammable. In accordance with Article 80 of the California Fire Code, the storage area for the lubrication oil would be equipped with a fire extinguishing system and the lubrication oil would be handled in accordance with an HMBP approved by the SFDPH and the CEC. With proper storage and handling of flammable materials in accordance with the California Fire Code and the site-specific HMBP, the risk of fire and explosion at the generating facility would be minimal.

The natural gas fuel the facility will use is flammable and could leak from the pipeline that brings the gas from the main PG&E distribution pipeline. Natural gas is composed mostly of methane, but also may contain ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless, and is lighter than air. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and explosion if an accidental release were to

occur. However, the risk of a fire and/or explosion would be reduced through compliance with applicable codes, regulations, and industry design/construction standards.

The federal safety and operating requirements for natural gas pipelines are contained in Title 49 of the Code of Federal Regulations, Parts 190 through 192. These requirements vary according to population density and land use; the pipeline classes are defined as follows:

- Class 1 includes pipelines in locations with 10 or fewer buildings intended for human occupancy.
- Class 2 includes pipelines in locations with more than 10, but fewer than 46 buildings intended for human occupancy.
- Class 3 includes pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days per week for 10 weeks in any 12-month period.
- Class 4 includes pipelines in locations where buildings with 4 or more stories aboveground are prevalent.

The project's pipeline will be designed to meet Class 3 service and will meet California Public Utilities Commission General Order 112-D and 58-A standards, in addition to the federal requirements for gas pipeline construction and safety.

The closest San Francisco fire station is Station No. 37 at 789 Wisconsin Street. The station is approximately 0.6 mile away and would provide the first response to a fire at the project site. If hazardous materials were involved in the incident, the San Francisco Fire Department Hazardous Materials Team located in Station No. 36 at 109 Oak Street would also be called to respond. This station is located approximately 2 miles from the project site. In addition, the San Francisco Environmental Health Section of the Department of Public Health provides emergency responders that serve as technical consultants for the Fire Department's Hazardous Materials Team.

### 8.12.7 Cumulative Impacts

A cumulative impact of the use and storage of hazardous materials could occur if there were a simultaneous release of a chemical that could migrate offsite from two or more sites. Potentially, the two or more migrating releases could combine, thereby posing a greater threat to the offsite population than a single release from any single site. Ammonia is the only hazardous material that will be used during project operation that would be stored in sufficient quantity onsite to have the potential to cause such a cumulative impact.

As discussed in Subsection 8.12.5, an ammonia plume that could occur as a result of a catastrophic release from the ammonia tank would be expected to extend a maximum of 90 feet eastward from the ammonia tank, just over the project fence onto Potrero PP. To determine if other facilities have the potential to result in cumulative release of chemicals, the facilities that have filed an RMP with the SFDPH were identified and are summarized in Table 8.12-7. These facilities with completed RMPs would be considered to have the greatest potential to cause a cumulative impact in the event of a simultaneous release. As shown in Table 8.12-7, the identified facilities all handle ammonia and are located a minimum of

0.5 mile from the project site (with the exception of the Potrero PP adjacent to the site). Therefore, these facilities are located outside of the area where, if simultaneous releases were to occur, no cumulative impacts would be expected as a result of a release from one of these facilities and the project.

TABLE 8.12-7  
Facilities in San Francisco That Have Filed a Risk Management Plan

Site Name	Address	Regulated Substance	Approximate Distance from Project Site, Miles
UCSF/CUP Containment Structure	2 Medical Center Way	Ammonia	4
C.J. Figone Cold Storage	420 17th Street	Ammonia	0.5
Dean's Services	1600 Donner Avenue	Ammonia	2.4
Anchor Brewing Co.	1705 Mariposa Street	Ammonia	0.8
Growers Refrigeration, Inc.	2050 Galvez Avenue	Ammonia	0.9
Potrero PP (in progress)	1201 Illinois Street	Ammonia	0.1*

Sources: SFDPH, 2003

\* The Potrero PP has not yet filed an RMP with the San Francisco Department of Public Health, but intends to do so.

The Potrero PP, located 700 feet to the east of the project, is in the process of completing an RMP for ammonia. Until the Potrero PP RMP has been filed, the cumulative impacts of a simultaneous release from the SFERP and Potrero PP tanks cannot be evaluated.

## 8.12.8 Proposed Mitigation Measures

The following subsections present measures included in the project to mitigate potential public health and environmental impacts of handling hazardous materials and regulated substances during construction and operation.

### 8.12.8.1 Construction Phase

As discussed in Subsection 8.12.4, the hazardous materials that would be used during construction present a relatively low public health risk, but could contaminate surface water or groundwater if a release occurred. Registering these hazardous materials in accordance with Article 21 of the San Francisco Health Code and use of best management practices would reduce the potential for the release of construction-related fuels and other hazardous materials to stormwater and receiving waters as discussed in Subsection 8.14, Water Resources. Best management practices prevent sediment and stormwater contamination from spills or leaks, control the amount of runoff from the site, and require proper disposal or recycling of hazardous materials.

Service personnel will follow general industry health, safety, and environmental standards for filling and servicing construction equipment and vehicles. The standards are designed to reduce the potential for incidents involving the hazardous materials. They include the following:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills.
- Vehicle and equipment service and maintenance will be conducted only by authorized personnel.



- Refueling will be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans will be placed under equipment to catch potential spills during servicing.
- All disconnected hoses will be placed in containers to collect residual fuel from the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- Refueling will be performed away from bodies of water to prevent contamination of water in the event of a leak or spill.
- When refueling is completed, the service truck will leave the project site.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as absorbents.
- Should a spill contaminate soil, the soil will be put in containers and disposed of as appropriate. All containers used to store hazardous materials will be inspected at least once per week for signs of leaking or failure. All maintenance and refueling areas will be inspected monthly. Results of inspections will be recorded in a logbook that will be maintained onsite.

In the unlikely event of a spill, the spill may need to be reported to the appropriate regulatory agencies and cleanup of contaminated soil could be required. Small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews. All personnel working on the project during the construction phase will be trained in handling hazardous materials and the dangers associated with hazardous materials. An onsite health and safety person will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary.

If there is a large spill from a service or refueling truck, contaminated soil will be placed into barrels or trucks by service personnel for offsite disposal at an appropriate facility in accordance with law. If a spill involves hazardous materials equal to or greater than the specific reportable quantity (25 gallons for petroleum products), all federal, state, and local reporting requirements will be followed. In the event of a fire or injury, the local fire department will be called (City of San Francisco Station No. 37).

### **8.12.8.2 Operation Phase**

During facility operation, various hazardous materials and one regulated substance will be stored onsite. Tables 8.12-5 and 8.12-6 describe the toxicity of the regulated substance and hazardous materials. Listed below are mitigation measures for minimizing the public health risks associated with hazardous material and regulated substance handling during facility operation.

**8.12.8.2.1 Hazardous Materials.** All hazardous materials will be handled and stored in accordance with applicable codes and regulations specified in Subsection 8.12.2. Specific requirements of the California Fire Code that reduce the risk of fire or the potential for a release of hazardous materials that could affect public health or the environment include:

- Provision of an automatic sprinkler system for indoor hazardous material storage areas.

- Provision of an exhaust system for indoor hazardous material storage areas.
- Separation of incompatible materials by isolating them from each other with a noncombustible partition.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment is required to hold the entire contents of the tank plus the volume of water for the fire suppression system that could be used for fire protection for a period of 20 minutes in the event of a catastrophic spill.

In addition, an HMBP is required by CCR Title 19 and the Health and Safety Code (Section 25504) as well as Article 21 of the San Francisco Health Code, which incorporates state requirements for hazardous materials handling and specifies some more stringent requirements. In accordance with these regulations, the HMBP will include an inventory and location map of hazardous materials onsite and an emergency response plan for hazardous materials incidents. Specific topics to be covered in the plan include:

- Facility identification
- Emergency contacts
- Chemical inventory information (for every hazardous material)
- Site map
- Emergency notification data
- Procedures to control actual or threatened releases
- Emergency response procedures
- Training procedures
- Certification

The HMBP will be filed with the SFDPH and updated annually in accordance with applicable regulations. The SFDPH will ensure review by and distribution to other potentially affected agencies including the San Francisco Fire Department.

In accordance with emergency response procedures specified in the HMBP, designated personnel will be trained as members of a plant hazardous material response team, and team members will receive the first responder and hazardous material technical training to be developed in the HMBP, including training in appropriate methods to mitigate and control accidental spills. However, in the event of a chemical emergency, plant personnel will defer to the San Francisco Hazardous Materials Team at San Francisco Fire Station No. 36 (109 Oak Street), approximately 2 miles away.

**8.12.8.2.2 Aqueous Ammonia.** Aqueous ammonia will be used in an selective catalytic reduction (SCR) process to control NO<sub>x</sub> emissions created in the combustion chambers of the combustion turbines. The SCR system will include a reactor chamber, catalyst modules, an ammonia storage system, and an ammonia injection system. The aqueous ammonia, stored as a liquid solution of 29 percent ammonia and 71 percent water, will be injected into the reactor chamber. The rate of injection will be controlled by a monitoring system that uses sensors to determine the correct quantity of ammonia to feed to the reactor chamber. The reactor chamber will contain the catalyst modules and be located where the catalyst will be most effective at the desired levels of plant operation.

Approximately once every 9 days during full operation (or a maximum of 14 deliveries per year), one 6,500-gallon tanker truck will deliver aqueous ammonia to the site. The ammonia will be stored in an aboveground stationary tank with a 12,000-gallon capacity contained within a secondary containment system, as required by the Uniform Fire Code. This containment system includes a concrete containment area surrounding the tank. The containment area will have a sloped floor, which will direct any liquid to a 24-inch drain centered below the tank. This drain will lead to a covered sump. The aqueous ammonia storage tank will be equipped with continuous tank level monitors, automated leak detection system, temperature and pressure monitors and alarms, and excess flow and emergency block valves.

Ammonia is a regulated substance under the federal Clean Air Act pursuant to 40 CFR 68 (Subpart G) and the CalARP pursuant to Health and Safety Code Sections 25331 through 25543.3. The California program is similar to the federal program but is more stringent in some areas.

In accordance with CalARP regulations, a RMP will be required in addition to the HMBP described above. The RMP includes a hazard assessment to evaluate the potential effects of an accidental release, a program for preventing an accidental release, and a program for responding to an accidental release. The specific components of an RMP include:

- Description of the facility
- Accident history of the facility
- History of equipment used at the facility
- Design and operation of the facility
- Site map(s) of the facility
- Piping and instrument diagrams of the facility
- Seismic analysis
- Hazard and operability study
- Prevention program
- Consequence analysis
- Offsite consequence analysis
- Emergency response
- Auditing and inspection
- Record keeping
- Training
- Certification

The RMP is prepared interactively with the SFDPH and the public is provided with an opportunity for review and input to the plan as part of the public hearing/ notification requirements of Article 21A of the San Francisco Health Code. The RMP will be filed with and administered by the SFDPH. This department will ensure review by and distribution to other potentially affected agencies including the San Francisco Fire Department and Bay Area Air Quality Management District.

A Process Safety Management Plan (PSM) will not be required under OSHA, because the OSHA regulations apply only to aqueous ammonia solutions above 44 percent (29 CFR Part 199). The requirements for a PSM are very similar to those for an RMP although an

offsite consequences analysis is not required for the PSM. The RMP may be sufficient to also meet the requirements of a PSM plan, if required.

**8.12.8.2.3 Petroleum Products.** Federal and California regulations require a SPCC plan if petroleum products above certain quantities are stored. Both federal and state laws apply only to petroleum products that might be discharged to navigable waters. If stored quantities are equal to or greater than 660 gallons for a single container, or equal to or greater than 1,320 gallons total (including ASTs, oil-filled equipment, and drums), an SPCC must be prepared. Since the facility will store more than 1,320 gallons of petroleum products, an SPCC plan will be prepared.

**8.12.8.2.4 Transportation/Delivery of Hazardous Materials and Regulated Substances.** Hazardous materials and one regulated substance will be delivered periodically to the facility. As discussed in Subsection 8.10, Traffic and Transportation, transportation of hazardous materials will comply with all Department of Transportation (Caltrans), USEPA, California Department of Toxic Substances Control (DTSC), CHP, and California State Fire Marshal regulations. Under the California Vehicle Code, the CHP has the authority to adopt regulations for transporting hazardous materials in California. The CHP can issue permits and specify the route for hazardous material delivery. Aqueous ammonia, the only regulated substance that will be delivered to the facility, will be transported in accordance with Vehicle Code Section 32100.5, which regulates the transportation of hazardous materials that pose an inhalation hazard. In addition, ammonia will only be transported along approved transportation routes. The approved route would be from Interstate 280 to Cesar Chavez Street, to Third Street, to 23rd Street, to the project site.

### **8.12.8.3 Monitoring**

In accordance with applicable federal, state, and local regulations, site personnel would regularly inspect all hazardous materials handling facilities for compliance with applicable regulations and would ensure that any deficiencies were promptly repaired. In addition, the facility would be subject to regular inspections by the SFDPH and San Francisco Fire Department, which would ensure compliance with appropriate regulatory requirements for hazardous materials and regulated substances handling.

## **8.12.9 Involved Agencies and Agency Contacts**

Several agencies regulate hazardous materials and they will be involved in regulating the hazardous materials stored and used at the facility. At the federal level, the USEPA will be involved; at the state level, the California Environmental Protection Agency (CalEPA) will be involved. However, local agencies are primarily responsible for enforcing hazardous materials laws. For the project, the local agencies involved will be the SFDPH and San Francisco Fire Department, Fire Prevention Bureau. The persons to contact are shown in Table 8.12-8.

TABLE 8.12-8  
Agency Contacts

Type Material	Agency	Contact	Title	Telephone
Storage of Hazardous Materials and Regulated Substances	San Francisco Department of Public Health	Sue Cone	Program Manager	(415) 252-3991
Storage of Hazardous Materials and Regulated Substances	San Francisco Fire Department	Mary Boucher	Fire Inspector	(415) 558-3306
Hazardous Materials Response	San Francisco Fire Department	Battalion Chief Barden	Battalion 2 Chief	(415) 558-3236

### 8.12.10 Permits Required and Permit Schedule

The SFDPH will require an HMBP for the storage of hazardous materials during construction and operation as well as an RMP for the storage of regulated substances. In addition, the San Francisco Fire Department could require the following permits related to construction of the chemical handling facilities and hazardous materials use during operation:

- **Building Permit.** This permit is required for construction of the aboveground storage tanks.
- **Fire Permit.** This permit is required for installation of the aboveground storage tanks.
- **Hazardous Materials Use and Storage Permit.** This permit is required for the use of hazardous materials during operation.

### 8.12.11 References

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